

**CLAIMS**

1. A composition comprising:
  - A. 0.05 wt% to 15 wt% of an irradiated butene-1 polymer material having a melt strength greater than 1 cN and a Young's modulus of less than 1000 MPa; and
  - B. 85 wt% to 99.95 wt% of a non-irradiated butene-1 polymer material;wherein the sum of components of A and B is equal to 100 wt%.
2. The composition of claim 1 wherein the irradiated butene-1 polymer material is present in an amount from 0.1 wt% to 10 wt%.
3. The composition of claim 1 wherein the irradiated butene-1 polymer material is chosen from:
  - (a) a homopolymer of butene-1;
  - (b) copolymers or terpolymers of butene-1 with ethylene, propylene or C<sub>5</sub>-C<sub>10</sub> alpha-olefins, the comonomer content ranging from 1 mole % to 15 mole %; and;
  - (c) mixtures thereof.
4. The composition of claim 3 wherein the irradiated butene-1 polymer material is a homopolymer of butene-1.
5. An irradiated butene-1 polymer material obtained by irradiating a butene-1 polymer material chosen from:
  - (a) a homopolymer of butene-1;
  - (b) copolymers or terpolymers of butene-1 with ethylene, propylene or C<sub>5</sub>-C<sub>10</sub> alpha-olefins, the comonomer content ranging from 1 mole % to 15 mole %; and
  - (c) mixtures thereof;with high energy ionizing radiation at a total radiation dosage of 5 to 45 Mrad in an environment in which the active oxygen concentration is less than 15 % by volume, thereby forming an irradiated butene-1 polymer material; wherein the irradiated butene-1 polymer has a melt strength greater than 1 cN and Young's Modulus less than 1000 MPa.
6. The irradiated butene-1 polymer material of claim 5 wherein the total radiation dosage is from 10 Mrad to 36 Mrad.
7. The irradiated butene-1 polymer material of claim 5 wherein the polymer is a homopolymer of butene-1.

8. A composition comprising:
- C. 5 wt% to 95 wt% of an irradiated butene-1 polymer material chosen from:
- (1) a homopolymer of butene-1;
  - (2) copolymers or terpolymers of butene-1 with ethylene, propylene or C<sub>5</sub>-C<sub>10</sub> alpha-olefins, the comonomer content ranging from 1 mole % to 15 mole %; and
  - (3) mixtures thereof;
- having a melt strength greater than 1 cN and a Young's modulus of less than 1000 MPa; and
- D. 5 wt% to 95 wt% of a non-irradiated propylene polymer material;
- wherein the sum of components of C and D is equal to 100 wt%.
9. The composition of claim 8 wherein the irradiated butene-1 polymer material is present in an amount from 20 wt% to 90 wt%.
10. The composition of claim 8 wherein the irradiated butene-1 polymer material is a homopolymer of butene-1.
11. A process for nucleating a non-irradiated butene-1 polymer material comprising:
- (1) irradiating a butene-1 polymer chosen from:
    - (a) a homopolymer of butene-1;
    - (b) copolymers or terpolymers of butene-1 with ethylene, propylene or C<sub>5</sub>-C<sub>10</sub> alpha-olefins, the comonomer content ranging from 1 mole % to 15 mole %; and
    - (c) mixtures thereof;
- with high energy ionizing radiation at a total radiation dosage of 5 to 45 Mrad, in an environment in which the active oxygen concentration is less than 15 % by volume; wherein the irradiated butene-1 polymer has a melt strength greater than 1 cN and Young's Modulus less than 1000 MPa;
- (2) treating the irradiated butene-1 polymer obtained in step (1) to deactivate substantially all free radicals present in the irradiated butene-1 polymer, thereby producing a high melt strength butene-1 polymer;
  - (3) blending the high melt strength butene-1 polymer obtained in step (2) with a non-irradiated butene-1 polymer material, thereby producing a blended polymer composition; and

- (4) compounding the blended polymer composition;  
wherein the crystallization rate of the non-irradiated butene-1 polymer material is increased.
12. The process according to claim 11 wherein the total radiation dose is from 10 Mrad to 36 Mrad.
13. The process according to claim 11 wherein the butene-1 polymer material is a homopolymer of butene-1.